RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:57:02

Input Set : A:\PTO.txt
Output Set: N:\CRF3\08092001\I817762.raw

<110> APPLICANT: Spalding, Edgar P.
Noh, Bosl
<120> TITLE OF INVENTION: MDR-Like ABC Transporter Gene From
Plants
<130> FILE REFERENCE: 13238-00061
C--> <140> CURRENT APPLICATION NUMBER: US/09/817,762
C--> <141> CURRENT FILING DATE: 2001-03-26
<150> PRIOR APPLICATION NUMBER: PCT/US99/22363
<151> PRIOR FILING DATE: 1999-09-24
<150> PRIOR APPLICATION NUMBER: US 60/101,814
<151> PRIOR FILING DATE: 1998-09-25
<160> NUMBER OF SEQ ID NOS: 14
<170> SOFTWARE: FastSEQ for Windows Version 4.0
<210> SEQ ID NO: 1
<211> LENGTH: 4051
<212> TYPE: DNA
<213> ORGANISM: Arabidopsis thaliana
<220> FEATURE:
<221> NAME/KEY: misc_feature
<222> LOCATION: (94)...(0)
<223> OTHER INFORMATION: Translation start codon
<221> NAME/KEY: misc_feature
<222> LOCATION: (3932)...(0)
<223> OTHER INFORMATION: Stop codon
<400> SEQUENCE: 1

cttgaacttc acaaaacaat tgtcagattt tcaagaaaaa ctttataaaa caaaaaacat 60
ttcattcttt ctctctctct ctctcactgc tcaatgatct cgttttctca ctaaaccaac 120
tcgtttcttc ttactttctt taactcggat ctacaaaaaa ccatgtcgga aactaacaca 180
accgatgcca agactgttcc agcagaagca gagaagaaga aagaacagag tttaccattc 240
tttaaactct tttctttcgc tgataaattt gattatctct taatgttcgt tggttctctt 300
ggtgccattg ttcatggctc ttccatgcct gtcttctttt tactctttgg tcaaatggtt 360
aatggatttg gtaaaaacca aatggattta catcaaatgg ttcatgaagt ctctagatat 420
tctctatatt tcgtctactt gggtttggtc gttlgcttct cttcttacgc agagatagca 480
tgttggatgt attctggaga aagacaagta gcagcattaa ggaagaaata tcttgaagca 540
gtattaaaac aagacgttgg gttctttgat actgatgcta gaactggtga cattgtcttt 600
agtgtttcta ctgatactct tcttgttcaa gatgccatta gtgaaaaggt tggaaacttt 660
atacattacc tctcaacatt tttggcggga ttagtagttg gatttgtatc agcatggaaa 720
ttagctttgt taagtgttgc tgtgattccc ggaatcgctt tcgccggagg tttatacgct 780
tatacactca ccggaattac ttcaaagagc cgtgaatctt atgctaacgc cggtgttatc 840
gccgagcagg caattgctca agttcgaact gtttattctt atgttggaga gagtaaggca 900
cttaatgcgt attcggatgc gattcagtat acgcttaagc tcggttataa agcggggatg 960
gctaaagggt tgggtttagg atgtacttat ggaatagctt gtatgtcatg ggctttggtg 1020
[illegible] 1080

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:57:02

Input Set : A:\PTO.txt
Output Set: N:\CRF3\08092001\I817762.raw

63 aatattttct tcccttctgg gaaaactgtg gcggttgttg gtgggagtgg ctctggaaag 1380
64 agtactgttg tttccctcat tgagagattc tatgatccaa acagcgggca aattctgttg 1440
65 gatggtgttg agataaagac gcttcagttg aagtttttgc gtgaacaaat cgggcttgtg 1500
66 aatcaagaac ctgcgctctt tgccactact atactagaga acatactcta tggaaagcct 1560
67 gatgcaacaa tggttgaagt tgaagctgct gcttccgctg cgaatgcgca tagtttcatt 1620
68 acattacttc ctaaaggcta cgacacacag gttggagaac gtggtgttca actctcaggt 1680
69 ggacagaagc agagaattgc aattgctagg gcgatgttga aagacccaaa gattctgtta 1740
70 ctagatgaag ctacaagcgc tcttgatgct agctctgaga gcattgttca ggaagcttta 1800
71 gacagagtca tggtggggag gaccactgtt gttgttgctc atcgtctctg caccatcaga 1860
72 aatgttgatt ccattgccgt gatacagcaa ggccaagttg ttgaaaccgg aacacatgaa 1920
73 gaactcattg ccaaatccgg tgcttacgca tccctcatca ggtttcagga aatggttggt 1980
74 actcgagatt tctcaaaccc gtcaactcgt cgcactcgtt caacccgttt gagccattca 2040
75 ctgtcaacga aatcactcag tttaagatca ggaagtttga ggaatctgag ctattcttac 2100
76 agcactggag ctgatggtcg gatagagatg atttcaaatg cagagactga ccgaaagact 2160
77 cgtgcccctg aaaattactt ctacaggctt ctcaagctta attcaccgga atggccttac 2220
78 tcaatcatgg gagcagtagg ctcaattctt tctggtttca ttggtcctac atttgctatt 2280
79 gtgatgagca acatgatcga agtcttctac tacacagact atgattcaat ggaaaggaaa 2340
80 acaaaagagt atgtcttcat ctacattggt gctggtctct atgctgtggg tgcttatttg 2400
81 atccaacatt acttctttag catcatggga gaaaacctca caacaagagt aagaagaatg 2460
82 atgctctcag ctatcttgag aaacgaagtt ggttggttcg atgaggatga acacaactca 2520
83 agcctgatcg ctgcacgttt agctactgat gcagcagatg ttaaatccgc tatagccgag 2580
84 agaatctcag taattctaca aaacatgact tcacttctca catccttcat agtcgccttc 2640
85 atagtagaat ggagagtctc acttctcatc ttaggcacat tcccacttct agtcctcgct 2700
86 aactttgctc agcaactatc tctgaagggt tttgctggag acacagctaa ggctcatgca 2760
87 aagacttcaa tgattgctgg tgaaggagtc agtaacatta gaaccgtagc agctttcaat 2820
88 gcacagagca agattctctc tttgttctgt catgagcttc gtgtacctca gaaaagaagc 2880
89 ttaagcttat accgaagtca aacctcgggt ttcctatttg gcctctcgca gcttgctctc 2940
90 tatggttctg aggctttaat tctctggtat ggtgcccacc ttgtgagtaa aggcgtgtca 3000
91 acctttttcca aagtgatcaa agtgtttgtg gttttggtca ttactgcaaa ctctgttgct 3060
93 gaaactgtca gtcttgctcc tgaaattatt cggggaggtg aagctgttgg ttcggttttc 3120
94 tcggtcttgg acaggcagac caggattgac ccggatgatg ctgatgctga tcccgtggag 3180
95 acgatccgtg gagacattga gtttaggcat gttgatttcg cttacccttc aagacccgac 3240
96 gtcatggttt tcagggactt taacctcaga attcgagctg gacatagcca agctcttgtg 3300
97 ggcgcgagtg ggtcagggaa gagttctgta attgcgatga tcgagcggtt ttacgacctt 3360
98 cttgctggaa aagtcatgat tgatggcaaa gacatccgcc ggctaaacct gaaatctcta 3420
99 aggctcaaaa tcggtcttgt tcaacaagaa ccagctcttt tcgcagcaac gatcttcgac 3480
100 aacatcgcct atggtaaaga tggtgcaact gaatccgagg taattgatgc agctcgagcc 3540
101 gcaaatgctc acggtttcat cagtggttta cctgaaggtt acaaaactcc agtaggcgaa 3600
102 agaggagtgc agttatcagg tggacagaaa cagaggatcg cgatagcaag agctgtgctc 3660
103 aagaacccta cagtgttgct tctagacgaa gcaactagcg cactagatgc agaatcagaa 3720
104 tgcgtgctgc aagaggcgtt agagaggctc atgagaggtc ggaccaccgt ggtagttgct 3780
105 caccgcttgt ccaccataag aggtgttgat tgcattggtg tgattcaaga cgggcggatt 3840
106 gtggagcaag gcagccattc agagctcgtt agccgaccag agggagctta ttcaaggctg 3900
107 ttacagcttc aaacacatag gatttgaagc ttgatcatgg attaaaaaca aaaaatcggt 3960
108 ttgtgtaaat ttttttatat taaaagttta atttggaaga tttctatgga ctataacgat 4020

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:57:02

Input Set : A:\PTO.txt
Output Set: N:\CRF3\08092001\I817762.raw

<213> ORGANISM: Arabidopsis thaliana

<400> SEQUENCE: 2

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 1               5                  10                  15
Met Ser Glu Thr Asn Thr Thr Asp Ala Lys Thr Val Pro Ala Glu Ala
Glu Lys Lys Lys Glu Gln Ser Leu Pro Phe Phe Lys Leu Phe Ser Phe
            20                  25                  30
Ala Asp Lys Phe Asp Tyr Leu Leu Met Phe Val Gly Ser Leu Gly Ala
        35                  40                  45
Ile Val His Gly Ser Ser Met Pro Val Phe Phe Leu Leu Phe Gly Gln
    50                  55                  60
Met Val Asn Gly Phe Gly Lys Asn Gln Met Asp Leu His Gln Met Val
65                  70                  75                  80
His Glu Val Ser Arg Tyr Ser Leu Tyr Phe Val Tyr Leu Gly Leu Val
                85                  90                  95
Val Cys Phe Ser Ser Tyr Ala Glu Ile Ala Cys Trp Met Tyr Ser Gly
            100                 105                 110
Glu Arg Gln Val Ala Ala Leu Arg Lys Lys Tyr Leu Glu Ala Val Leu
        115                 120                 125
Lys Gln Asp Val Gly Phe Phe Asp Thr Asp Ala Arg Thr Gly Asp Ile
    130                 135                 140
Val Phe Ser Val Ser Thr Asp Thr Leu Leu Val Gln Asp Ala Ile Ser
145                 150                 155                 160
Glu Lys Val Gly Asn Phe Ile His Tyr Leu Ser Thr Phe Leu Ala Gly
                165                 170                 175
Leu Val Val Gly Phe Val Ser Ala Trp Lys Leu Ala Leu Leu Ser Val
            180                 185                 190
Ala Val Ile Pro Gly Ile Ala Phe Ala Gly Gly Leu Tyr Ala Tyr Thr
        195                 200                 205
Leu Thr Gly Ile Thr Ser Lys Ser Arg Glu Ser Tyr Ala Asn Ala Gly
    210                 215                 220
Val Ile Ala Glu Gln Ala Ile Ala Gln Val Arg Thr Val Tyr Ser Tyr
225                 230                 235                 240
Val Gly Glu Ser Lys Ala Leu Asn Ala Tyr Ser Asp Ala Ile Gln Tyr
                245                 250                 255
Thr Leu Lys Leu Gly Tyr Lys Ala Gly Met Ala Lys Gly Leu Gly Leu
            260                 265                 270
Gly Cys Thr Tyr Gly Ile Ala Cys Met Ser Trp Ala Leu Val Phe Trp
        275                 280                 285
Tyr Ala Gly Val Phe Ile Arg Asn Gly Gln Thr Asp Gly Gly Lys Ala
    290                 295                 300
Phe Thr Ala Ile Phe Ser Ala Ile Val Gly Gly Met Ser Leu Gly Gln
305                 310                 315                 320
Ser Phe Ser Asn Leu Gly Ala Phe Ser Lys Gly Lys Ala Ala Gly Tyr
                325                 330                 335
Lys Leu Met Glu Ile Ile Asn Gln Arg Pro Thr Ile Ile Gln Asp Pro
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RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:57:02

Input Set : A:\PTO.txt
Output Set: N:\CRF3\08092001\I817762.raw

```
165      370                 375                 380
166  Asn Phe Asn Ile Phe Phe Pro Ser Gly Lys Thr Val Ala Val Val Gly
167  385                 390                 395                 400
168  Gly Ser Gly Ser Gly Lys Ser Thr Val Val Ser Leu Ile Glu Arg Phe
169                  405                 410                 415
170  Tyr Asp Pro Asn Ser Gly Gln Ile Leu Leu Asp Gly Val Glu Ile Lys
171              420                 425                 430
172  Thr Leu Gln Leu Lys Phe Leu Arg Glu Gln Ile Gly Leu Val Asn Gln
173          435                 440                 445
174  Glu Pro Ala Leu Phe Ala Thr Thr Ile Leu Glu Asn Ile Leu Tyr Gly
175      450                 455                 460
176  Lys Pro Asp Ala Thr Met Val Glu Val Glu Ala Ala Ala Ser Ala Ala
177  465                 470                 475                 480
178  Asn Ala His Ser Phe Ile Thr Leu Leu Pro Lys Gly Tyr Asp Thr Gln
179                  485                 490                 495
180  Val Gly Glu Arg Gly Val Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile
181              500                 505                 510
182  Ala Ile Ala Arg Ala Met Leu Lys Asp Pro Lys Ile Leu Leu Leu Asp
183          515                 520                 525
185  Glu Ala Thr Ser Ala Leu Asp Ala Ser Ser Glu Ser Ile Val Gln Glu
186      530                 535                 540
187  Ala Leu Asp Arg Val Met Val Gly Arg Thr Thr Val Val Val Ala His
188  545                 550                 555                 560
189  Arg Leu Cys Thr Ile Arg Asn Val Asp Ser Ile Ala Val Ile Gln Gln
190                  565                 570                 575
191  Gly Gln Val Val Glu Thr Gly Thr His Glu Glu Leu Ile Ala Lys Ser
192              580                 585                 590
193  Gly Ala Tyr Ala Ser Leu Ile Arg Phe Gln Glu Met Val Gly Thr Arg
194          595                 600                 605
195  Asp Phe Ser Asn Pro Ser Thr Arg Arg Thr Arg Ser Thr Arg Leu Ser
196      610                 615                 620
197  His Ser Leu Ser Thr Lys Ser Leu Ser Leu Arg Ser Gly Ser Leu Arg
198  625                 630                 635                 640
199  Asn Leu Ser Tyr Ser Tyr Ser Thr Gly Ala Asp Gly Arg Ile Glu Met
200                  645                 650                 655
201  Ile Ser Asn Ala Glu Thr Asp Arg Lys Thr Arg Ala Pro Glu Asn Tyr
202              660                 665                 670
203  Phe Tyr Arg Leu Leu Lys Leu Asn Ser Pro Glu Trp Pro Tyr Ser Ile
204          675                 680                 685
205  Met Gly Ala Val Gly Ser Ile Leu Ser Gly Phe Ile Gly Pro Thr Phe
206      690                 695                 700
207  Ala Ile Val Met Ser Asn Met Ile Glu Val Phe Tyr Tyr Thr Asp Tyr
208  705                 710                 715                 720
209  Asp Ser Met Glu Arg Lys Thr Lys Glu Tyr Val Phe Ile Tyr Ile Gly
                     725                 730                 735
```

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:57:02

Input Set : A:\PTO.txt
Output Set: N:\CRF3\08092001\I817762.raw

```
215  Ser Ala Ile Leu Arg Asn Glu Val Gly Trp Phe Asp Glu Asp Glu His
216      770                 775                 780
217  Asn Ser Ser Leu Ile Ala Ala Arg Leu Ala Thr Asp Ala Ala Asp Val
218  785                 790                 795                 800
219  Lys Ser Ala Ile Ala Glu Arg Ile Ser Val Ile Leu Gln Asn Met Thr
220                  805                 810                 815
221  Ser Leu Leu Thr Ser Phe Ile Val Ala Phe Ile Val Glu Trp Arg Val
222              820                 825                 830
223  Ser Leu Leu Ile Leu Gly Thr Phe Pro Leu Leu Val Leu Ala Asn Phe
224          835                 840                 845
225  Ala Gln Gln Leu Ser Leu Lys Gly Phe Ala Gly Asp Thr Ala Lys Ala
226      850                 855                 860
227  His Ala Lys Thr Ser Met Ile Ala Gly Glu Gly Val Ser Asn Ile Arg
228  865                 870                 875                 880
229  Thr Val Ala Ala Phe Asn Ala Gln Ser Lys Ile Leu Ser Leu Phe Cys
231                  885                 890                 895
232  His Glu Leu Arg Val Pro Gln Lys Arg Ser Leu Ser Leu Tyr Arg Ser
233              900                 905                 910
234  Gln Thr Ser Gly Phe Leu Phe Gly Leu Ser Gln Leu Ala Leu Tyr Gly
235          915                 920                 925
236  Ser Glu Ala Leu Ile Leu Trp Tyr Gly Ala His Leu Val Ser Lys Gly
237      930                 935                 940
238  Val Ser Thr Phe Ser Lys Val Ile Lys Val Phe Val Val Leu Val Ile
239  945                 950                 955                 960
240  Thr Ala Asn Ser Val Ala Glu Thr Val Ser Leu Ala Pro Glu Ile Ile
241                  965                 970                 975
242  Arg Gly Gly Glu Ala Val Gly Ser Val Phe Ser Val Leu Asp Arg Gln
243              980                 985                 990
244  Thr Arg Ile Asp Pro Asp Asp Ala Asp Ala Asp Pro Val Glu Thr Ile
245          995                 1000                1005
246  Arg Gly Asp Ile Glu Phe Arg His Val Asp Phe Ala Tyr Pro Ser Arg
247      1010                1015                1020
248  Pro Asp Val Met Val Phe Arg Asp Phe Asn Leu Arg Ile Arg Ala Gly
249  1025                1030                1035                1040
250  His Ser Gln Ala Leu Val Gly Ala Ser Gly Ser Gly Lys Ser Ser Val
251                  1045                1050                1055
252  Ile Ala Met Ile Glu Arg Phe Tyr Asp Leu Leu Ala Gly Lys Val Met
253              1060                1065                1070
254  Ile Asp Gly Lys Asp Ile Arg Arg Leu Asn Leu Lys Ser Leu Arg Leu
255          1075                1080                1085
256  Lys Ile Gly Leu Val Gln Gln Glu Pro Ala Leu Phe Ala Ala Thr Ile
257      1090                1095                1100
258  Phe Asp Asn Ile Ala Tyr Gly Lys Asp Gly Ala Thr Glu Ser Glu Val
259  1105                1110                1115                1120
260  Ile Asn Ala Ala Arg Ala Ala Asn Ala His Gly Phe Ile Ser Gly Leu
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VERIFICATION SUMMARY DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:57:03

Input Set : A:\PTO.txt
Output Set: N:\CRF3\08092001\I817762.raw

L:12 M:270 C: Current Application Number differs, Replaced Current Application Number
L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date

OIPE

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:39:43

Input Set : A:\SEQLISTCIP.txt
Output Set: N:\CRF3\08092001\I817762.raw

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      4 <110> APPLICANT: Spalding, Edgar P.
      5       Noh, Bosl
      7 <120> TITLE OF INVENTION: MDR-Like ABC Transporter Gene From
      8       Plants
     10 <130> FILE REFERENCE: 13238-00061
C--> 12 <140> CURRENT APPLICATION NUMBER: US/09/817,762
C--> 13 <141> CURRENT FILING DATE: 2001-03-26
     15 <150> PRIOR APPLICATION NUMBER: PCT/US99/22363
     16 <151> PRIOR FILING DATE: 1999-09-24
     18 <150> PRIOR APPLICATION NUMBER: US 60/101,814
     19 <151> PRIOR FILING DATE: 1998-09-25
     21 <160> NUMBER OF SEQ ID NOS: 14
     23 <170> SOFTWARE: FastSEQ for Windows Version 4.0
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ERRORED SEQUENCES

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   1404 <210> SEQ ID NO: 10
   1405 <211> LENGTH: 14000
   1406 <212> TYPE: DNA
   1407 <213> ORGANISM: Arabidopsis thaliana
   1409 <220> FEATURE:
   1410 <221> NAME/KEY: misc_feature
   1411 <222> LOCATION: (3429)...(0)
   1412 <223> OTHER INFORMATION: Translation start codon
   1414 <300> PUBLICATION INFORMATION:
   1415 <308> DATABASE ACCESSION NO: Genbank AP000386
   1416 <309> DATABASE ENTRY DATE: 1999-08-03
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   1421 tcatataatc aaaaaagaaa aaataattac tattgtttgt gttctttgca acaatgcgtt     180
   1422 agaaactcgg agaccacttg ttttttctct tatgatttcg cttcagtatg atttagcaaa     240
   1423 gcatctctac ggtacaaaat atcttacgaa ttgacatgat ctgatccaca ctatatcaag     300
   1424 gagttagaaa gacagaactg aaagcttctt agctcgatat gtatttcaag ctacggttca     360
   1425 caccatctag ggagacaaga atggaagaag gcatgacgtc aagtcgaact atgcagctct     420
   1427 cttacttaaa tgggtcgaca aacaaatacg gaaccaacta tcatccattc gagcaagcgg     480
   1428 tgataggtgg tatgactaag gtctctaaat ttggtttacg gcgaaaaatt aattgatcaa     540
   1429 aaaatttttg gtttagtgtt ttaagatctt tttcaaaaaa acgttgtatt tgatgtataa     600
   1430 acgctatttc ttttttgaaat taatttaata ttatttttgt ttgaaaagaa gaagaaacat     660
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```
   1435 acgaaaacatc gttgaagccg tgaagtggca ttggtctaca ctagagcaac tcaaaaaga      ..
   1436 aaccacttca catggtctgc tcttacattc ataaccgaat ctaagtcact tttagttggt     1020
   1437 tgtaattttg taactattat tccaacacct ctttttttac ttttagatt gttttataat     1080
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RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:39:44

Input Set : A:\SEQLISTCIP.txt
Output Set: N:\CRF3\08092001\I817762.raw

1438 agaaatattt taattcctaa attaataatg aaagtaaatg taatatgagt cagtacaata 1140
1439 tgtgaaaaac ttaaaaagtt gacagaattt agcatttgat taaaagtgta tgaagaagaa 1200
1440 gaaaaaagaa gatctttttg tatctataga tttagtgcat aacttttctc agattttcga 1260
1441 tatatacaag aatttaacat aagaaaaatc aagacaaatg gacctggtta taatcggtta 1320
1442 tctgttgtaa atattatatt tcatattctt ctccacttca taattcttat tggagttcct 1380
1443 tcaccaaatg tttgatgttc cattaaatta atctaccact ctaataagag gtatcgtact 1440
1444 acaaattaca cttcataaac aagagaagaa cataaatttg aatttttta aaaaaacata 1500
1445 tgcgttataa caccaaacag taacggacta gctgatcctt gaatttatat tagttgcaaa 1560
1446 aatttatata tcgaaattga aacatgaatt tttaaaatta ttagaaaatg tatgatgttg 1620
1447 tctaaatgtg acattacaaa tacatgatgt tgtttaaaaa ttattataaa acaaccaaag 1680
1448 tttggcgtca ttctggtaaa cgcacttaat gaatttatat acagttaaag attttaacat 1740
1449 caaattttaa aatgacaact taactaaaat ttgtatccta atatttttac tagagaaact 1800
1450 cacacatatt tttcaaacaa atgattagtt atatatcctt cgataatagg tattgtgtaa 1860
1451 aactgtgtgg tttgcacaag tgatccctcg atattctttc tgctaaagat cgacttccca 1920
1452 cagtttcgat atctcgggtt tgggtgcaat agcatatgct tgtttagtat gcagataatc 1980
1453 gtatgagaga gtcagagaga tcatctattt ttcatgatat ggtctgagct aatcgatcat 2040
1454 ttgttattta tactcgataa cgttctaatt tgtatgattt ttcagccttg atctatcaca 2100
1455 aaatggagat aatgaaatgg tagtcataag aaaggtaatg atccccttga catgcttatt 2160
1456 ataacacaaa aagtaatcgc tactgattag cttaccctat gatttgaatc atataacttt 2220
1457 atactaattg tctaagtgtg atgatataat gtatatgatg tcatttataa cttattagta 2280
1458 aaaatataaa gttcttcatc attgtcataa ggagttaatt ggatatacat caaaaaattt 2340
1459 cctaaatttt tagaaattat taatcaagtt ataatagaaa ttattaaata aaatatatga 2400
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1461 ccaaagtaca tcatcattgt gatgaagact ttaatggatt tatacatttc aaagttttaa 2520
1462 acattactta tttaaatgaa aaattgagct aaaatttgta tacttatatg ttgaccatag 2580
1463 aaatacttct atataatttt agacaagttg tctatacata tatatatata tatatatata 2640
1464 tatatatatg tatttacaca aaaatcaagt tttcttaatg taacaatata aaaatataaa 2700
1465 atatctaatg ttgtttaaaa attatttaga ccaaaaaaaa aaaaaactgt aatcaaactt 2760
1466 tcattggatt atatctaact ctaaacatga atttttatac aatgacatgt tcaataaaat 2820
1467 tcccatttca tagtttgacc agaaaaaatg cttgcagatt tgttaaaatc tctacttatg 2880
1468 caaaaccatt gaatcacacc agattttgat ttgtagtact ttaaaaatat taattgaaca 2940
1469 caacataact ttaacaaaaa agatctttat aaaaaaaaaa ctttctaaaa tgacattaat 3000
1470 taacacaaat tagtcaattc aaacaatcca ataaaatcaa agtaaaccct taattgtttt 3060
1471 ttttttccat tttacaaaat gttaaacatt aattacatca actagcaaca cgaatctctc 3120
1473 aatctctcat gtctcaatga gtctttgacc actagtcttc atcactctct ctcctcctta 3180
1474 tatataccaa tcacaccctt ctccaaccac actctcattc tctctctctt ctcaccactt 3240
1475 caaaacaaga cactcgtaaa agagttcttg aacttcacaa aacaattgtc agattttcaa 3300
1476 gaaaaacttt ataaaacaaa aaacatttca ttctttctct ctctctctct cactgctcaa 3360
1477 tgatctcgtt ttctcactaa accaactcgt ttcttcttac tttctttaac tcggatctac 3420
1478 aaaaaaccat gtcggaaact aacacaaccg atgccaagac tgttccagca gaagcagaga 3480
1479 agaagaaaga acagagttta ccattcttta aactcttttc tttcgctgat aaatttgatt 3540
1480 atctcttaat gttcgttggt tctcttggtg ccattgttca tggctcttcc atgcctgtct 3600
1481 tctttttact ctttggtcaa atggttaatg gatttggtaa aaaccaaatg gatttacatc 3660
1482 aaatggttca tgaagtctct agagtaagtc tttttttttct ttcttgtttt tatcaaatta 3720
1483 ctctcaaagt ctgatctaat ttttgtgttt gtgaaatttt gcagtatttct ctatatttcg 3780

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:39:44

Input Set : A:\SEQLISTCIP.txt
Output Set: N:\CRF3\08092001\I817762.raw

1488 ttaaatcaga ttattaggca agaaatctaa aggtgtattt tttgagtttt atttgattct 4080
1489 tcctcaaagt gaccatttac tctgaaggta aaacattttt ttttactcta caacaaaaac 4140
1490 ccaacttctt tttttgtttg cttcaaaatt atattaaaaa aagaaagctt aaactttgtt 4200
1491 taaaatcttg tttttttttgt cattcgcttt tgattagaac taaaaaaacc atttttatag 4260
1492 aatgttgttt acataagtga tgtaatgggg ttcggaacga actttccgtg ccaaccgctt 4320
1493 ttatagacaa gaaatctaaa ggtgtaattt ttgagttttt atttgattct tccacaaagt 4380
1494 gatcatttac tctggtaaac attttttttac tctacaacaa aaacccaact tttttatgtt 4440
1495 tgcttcaata aataaaaacc tagaaacaga aatcacaatc tagagagaat caaaattata 4500
1496 tataaaaaaa aaacacttca aatttttaaa aatttttaata tgttaaaagg ataagccaag 4560
1497 tccacgtgat tcatggacta ctactttgtc tatatcgaaa aaaaaaaaaa aatgggcatc 4620
1498 tctctcacat ttattacaac ttcataaaaa ttcttgtaat aataaccata attttttgtt 4680
W--> 1499
aaataatttt acagagatag catgttggat gtattctgga gaaagacaag tagcagcatt 4740 aaggaagaaa tatcttgaag
E--> 1500 cagtattaaa acaagacgtt gggttctttg atactgatgc 4800
E--> 1501 tagaactggt gacattgtct ttagtgtttc tactgatact cttcttgttc aagatgccat 4860
E--> 1502 tagtgaaaag gtaaccattt tttttttttac taccaacaaa atctagtatt taccggcggg 4920
E--> 1503 tcccattttt ttcatgatca atctttatca aagttttggg tccgtttatg ttagcaaccg 4980
E--> 1504 tcgtttatct tgcgcctcag gtggttaggg aagaaaaaag actatagatt gatttttttt 5040
E--> 1505 tttgttaaaa taaaagttgg atttttttca taagattgtg aaaataagta atttttttt 5100
E--> 1506 acaaatttgc tatagaaata gaggattttt ttcactattt aactaaaact taaatgatat 5160
E--> 1507 agtactcatt ttcttacatt tttaatataa aaatagcttc ttttttttcca ttgtgaaaaa 5220
E--> 1508 tatttattat gcaaaataat gtttctttaa caagtaaaat aaatatttgt tattaaaaaa 5280
E--> 1509 aatgtgtaaa gtaccttcaa attttaatag tacattttat ctaaaactgt ttttttttt 5340
E--> 1510 gcaatttggt cctgtctctg tggtgcacgt tagcaagcac gagctaacat gcactgggtc 5400
E--> 1511 ccctagtttc attattatca tcactctttt ttattgttga tgaagtgaat taataacaga 5460
E--> 1512 gtagttgaaa aaaaattgaa tttctcaggt tggaaacttt atacattacc tctcaacatt 5520
E--> 1513 tttggcggga ttagtagttg gatttgtatc agcatggaaa ttagctttgt taagtgttgc 5580
E--> 1514 tgtgattccc ggaatcgctt tcgccggagg tttatacgct tatacactca ccggaattac 5640
E--> 1515 ttcaaagagc cgtgaatctt atgctaacgc cggtgttatc gccgagcagg taaataaaga 5700
E--> 1516 ttaaagtttg ttcctttatt tgttttattt aatgcccacc aactgttcga cgtaatgctt 5760
E--> 1517 tttaactgtt cttaggcttg cttctttgta cttgatctct caaatgattt ttttttttt 5820
E--> 1519 tcattgcttc ttatgcaatc caaagactta aacagtgttt tcactaattc aaaatctttg 5880
W--> 1520
cttttctttg gtcggttaat gattgatgtt ttggtttctc aggcaattgc tcaagttcga 5940 actgtttatt cttatgttgg
E--> 1521 agagagtaag gcacttaatg cgtattcgga tgcgattcag 6000
E--> 1522 tatacgctta agctcggtta taaagcgggg atggctaaag ggttgggttt aggatgtact 6060
E--> 1523 tatggaatag cttgtatgtc atgggctttg gtgttttggt atgctggagt ttttattcgg 6120
E--> 1524 aatggacaaa ccgatggagg aaaggcgttt actgctatat tctctgctat tgttggtgga 6180
E--> 1525 atgtaagaat tcaaaacata acaatgatgt ggttttgtgt attttgtgtt ttgttattac 6240
E--> 1526 ttggatgtca ctttttgttt ctgtgtgtgt ttttaggagt ttggggcaat ctttctcgaa 6300
E--> 1527 tcttggggcg tttagtaaag gtaaagcggc tggttataag ttgatggaga taattaacca 6360
E--> 1528 gagaccgacg ataattcaag acccgttgga tggaaaatgt ttggatcaag ttcatgggaa 6420
E--> 1529 cattgagttt aaagatgtga cttttagcta tccttcacgg cctgatgtta tgatcttcag 6480
E--> 1530 gaactttaat attttcttcc cttctgggaa aactgtggcg gttgttggtg ggagtggctc 6540
E--> 1531 tggaaagagt actgttgttt ccctcattga gagattctat gatccaaaca gcggtaattt 6600

E--> 1535 actatactag agaacatact ctatggaaag cctgatgcaa caatggttga agttgaagct 6840
E--> 1536 gctgcttccg ctgcgaatgc gcatagtttc attacattac ttcctaaagg ctacgacaca 6900
E--> 1537 caggtataaa tcaaatattt gattatatgt ctagttaatg tcatggcctt ttgcttaatt 6960

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:39:44

Input Set : A:\SEQLISTCIP.txt
Output Set: N:\CRF3\08092001\I817762.raw

E--> 1538 ttttgttgaa tgtcaataca attaggttgg agaacgtggt gttcaactct caggtggaca 7020
E--> 1539 gaagcagaga attgcaattg ctagggcgat gttgaaagac ccaaagattc tgttactaga 7080
E--> 1540 tgaagctaca agcgctcttg atgctagctc tgagagcatt gttcaggaag ctttagacag 7140
E--> 1541 agtcatggtg gggaggacca ctgttgttgt tgctcatcgt ctctgcacca tcagaaatgt 7200
E--> 1542 tgattccatt gccgtgatac agcaaggcca agttgttgaa accggaacac atgaagaact 7260
E--> 1543 cattgccaaa tccggtgctt acgcatccct catcaggttt caggaaatgg ttggtactcg 7320
E--> 1544 agatttctca aacccgtcaa ctcgtcgcac tcgttcaacc cgtttgagcc attcactgtc 7380
E--> 1545 aacgaaatca ctcagtttaa gatcaggaag tttgaggaat ctgagctatt cttacagcac 7440
E--> 1546 tggagctgat ggtcggatag agatgatttc aaatgcagag actgaccgaa agactcgtgc 7500
E--> 1547 ccctgaaaat tacttctaca ggcttctcaa gcttaattca ccggaatggc cttactcaat 7560
E--> 1548 catgggagca gtaggctcaa ttctttctgg tttcattggt cctacatttg ctattgtgat 7620
E--> 1549 gagcaacatg atcgaagtct tctactacac agactatgat tcaatggaaa ggaaaacaaa 7680
E--> 1550 agagtatgtc ttcatctaca ttggtgctgg tctctatgct gtgggtgctt atttgatcca 7740
E--> 1551 acattacttc tttagcatca tgggagaaaa cctcacaaca agagtaagaa gaatgatgct 7800
E--> 1552 ctcaggtatg tatcaaaatc tcctgaattt gcttaaaatc actttcccat ttcttatttt 7860
E--> 1553 ggtttcttga ttgttcttat ttagctatct tgagaaacga agttggttgg ttcgatgagg 7920
E--> 1554 atgaacacaa ctcaagcctg atcgctgcac gtttagctac tgatgcagca gatgttaaat 7980
E--> 1555 ccgctatagc cgagagaatc tcagtaattc tacaaaacat gacttcactt ctcacatcct 8040
E--> 1556 tcatagtcgc cttcatagta gaatggagag tctcacttct catcttaggc acattcccac 8100
E--> 1557 ttctagtcct cgctaacttt gctcaggtaa ataatctaat ctttttactc aaaatctttc 8160
W--> 1558 aatattcatc aatcattaaa atataattgg aatcttgcat tcaccattat gatcttaaga 8220 aaaaacgaca
E--> 1559 aaaggccaga tttttataaa tttatatttg cttttcaaaa gttcaaaact 8280
E--> 1560 ttatagaaca tggcaacaca gccactgcct ctacacgtgc ttcatcttct aactttatcc 8340
E--> 1561 aagtttgcat ttatgtttac aataataatc ataaaagaat tattaagaag ctttttttt 8400
E--> 1562 ctacttttg gaaatagtgt aagggtcaag atcatggagc cctcacatca ataaatgtgc 8460
E--> 1563 taaaaaaatt aaaaaacagt aggctttagt ttactctctg ggcatgtgtg aagaatattt 8520
E--> 1565 attatatagt ttctattggt actatgaccc atagataaca gtgttcacga aaatagctaa 8580
E--> 1566 gattcctctg tcttttgctt ctgctaaatc tatcctactt taagctttca tatttacttc 8640
E--> 1567 actctctgaa ctctgaactg tgatcccact tctctcttta tttaattctt ttgcccataa 8700
E--> 1568 aacctcacca caaaaatcca aaaaatctgc aatttttttc cttcttagaa ccaatatttt 8760
E--> 1569 atttagagtt cttcattggt caaagttgtt gtctcagtgc attatttact tatcacagtg 8820
E--> 1570 tgtgtgtcag tgtttttaca ccatccacta gtcaatgttt gcttgtgggt ttctttgttt 8880
E--> 1571 tggtagatta ggttgtgatg agttttttt ttgtttctaa ctagctgcaa ggttcaggac 8940
E--> 1572 tctgctttga tatatcacca acatttttc acccgtgatc taattattag ttgaaaaatc 9000
E--> 1573 tatcaaatag atttcacaca gaagaacata gataggcatt gtacttgtac tgatgttgat 9060
E--> 1574 gggatagagt gttgcatatg tgatttaact atatggttct acgtcatgtt ttagtggcga 9120
E--> 1575 cttagacctt tgattgtcaa tcttattttt tacaagtgaa ctattattac catctgttgt 9180
E--> 1576 tctaaatcat aagtattaat atatgtggct acattgcagc aactatctct gaagggtttt 9240
E--> 1577 gctggagaca cagctaaggc tcatgcaaag acttcaatga ttgctggtga aggagtcagt 9300
E--> 1578 aacattagaa ccgtagcagc tttcaatgca cagagcaaga ttctctcttt gttctgtcat 9360
E--> 1579 gagcttcgtg tacctcagaa aagaagctta taccgaagtc aaacctcggg tttcctattt 9420
E--> 1580 ggcctctcgc agcttgctct ctatggttct gaggctttaa ttctctggta tggtgcccac 9480
E--> 1581 cttgtgagta aaggcgtgtc aacctttcc aaagtgatca aagtgtttgt ggttttggtc 9540
E--> 1582 attactgcaa actctgttgc tgaaactgtc agtcttgctc ctgaaattat tcggggaggt 9600
E--> 1583 gaagctgttg gttcggtttt ctcggtcttg gacaggcaga ccaggattga cccggatgat 9660

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:39:44

Input Set : A:\SEQLISTCIP.txt
Output Set: N:\CRF3\08092001\I817762.raw

E--> 1588 cggctaaacc tgaaatctct aaggctcaaa atcggtcttg ttcaacaaga accagctctc 9960
E--> 1589 ttcgcagcaa cgatcttcga caacatcgcc tatggtaaag atggtgcaac tgaatccgag 10020
E--> 1590 gtaattgatg cagctcgagc cgcaaatgct cacggtttca tcagtggttt acctgaaggt 10080
E--> 1591 tacaaaactc cagtaggcga aagaggagtg cagttatcag gtggacagaa acagaggatc 10140
E--> 1592 gcgatagcaa gagctgtgct caagaaccct acagtgttgc ttctagacga agcaactagc 10200
E--> 1593 gcactagatg cagaatcaga atgcgtgctg caagaggcgt tagagaggct catgagaggt 10260
E--> 1594 cggaccaccg tggtagttgc tcaccgcttg tccaccataa gaggtgttga ttgcattggt 10320
E--> 1595 gtgattcaag acgggcggat tgtggagcaa ggcagccatt cagagctcgt tagccgacca 10380
E--> 1596 gagggagctt attcaaggct gttacagctt caaacacata ggatttgaag cttgatcatg 10440
E--> 1597 gattaaaaac aaaaaatcgg tttgtgtaat ttttttata ttaaaacttt aatttggaag 10500
E--> 1598 atttctatgg actataacga taatatgaat aggtgtagat aatgaagctt ttggagtgtt 10560
E--> 1599 tatgaaggtt ctttaattaa gggttatttt tttcgcattt tgcttatgtg cccgttttgg 10620
E--> 1600 aacataagac tgaactatgt tttcgttatg tttttaattt atgcctcgaa acaaaacaaa 10680
E--> 1601 atcactctaa tactttggtt gatcaaaatt tccctaaaac atttggttca tgactagaat 10740
E--> 1602 tgatcggaca tgttctttta ggggtttgat ctcgcatggt ctaatcaggt tatgtggtct 10800
E--> 1603 tacagcgact taatcaattt agaccggcta tcaaaattag attcagccta aacagcaaaa 10860
E--> 1604 ttgtcttata taatatccta aatcacagac cggatttttt ttttttataa actctatcgg 10920
E--> 1605 ctgatccggt caaccccggt agaaacgcac tgaagtgttt catagtggac ttcaaaccga 10980
E--> 1606 aattttgcag aaattgagat gagaatgagc tctacctcgc attgacatgt tatttcgttc 11040
E--> 1607 ttgagatctt aagtaatttt ttgagatctt aagtaatttt ttggtattca agttccttat 11100
E--> 1608 ttttttgcgg ttactcgtct tgacatgtta tttcgttctt gtgctactta cataccacaa 11160
E--> 1609 tatatgtagg tttctaaaca tatataatag gaatgttgtt ctatatatgt gttgtttgat 11220
E--> 1611 acgtaaagag taatctggtt ctacgtagag tctatctctt gtttcttggt gagattttga 11280
E--> 1612 ctggactgca tggtaatcct cgcgcatggt gtttagttac cggttgcttc attcatttgg 11340
E--> 1613 ccacgctcaa attttctaga agactcttcg gtctttggta caaaggcctc cgatttttcc 11400
E--> 1614 atgacaagtt cattcatatt tttttgtgac aacttgattg ttgttcattt ccgaatattc 11460
E--> 1615 catgaacgta tcaaactcaa taaaatcgat tgttgtcact ccctttaaga tgagatcctc 11520
E--> 1616 aacggcagct tcaccactag ccatgttttc acacatgatc aactatctca catttttact 11580
E--> 1617 aaggctttaa gcaggaatat tacttctaga attttaacaa tctagaattt ctagaggaaa 11640
E--> 1618 tgttcacatg tatatatttt ggtatatgat ctagagaact tatataagat tatcaatgtt 11700
E--> 1619 taatatactc aacaaatggg ttcttctatt ttatcttcta attgttgggg ccttgaatta 11760
E--> 1620 tttagttctt tttcactatt ccttttcttt tatttggtgt gtggagccat aaagttccaa 11820
E--> 1621 taatttctat gaaaagaaat gaataaaatc taaagaaacc aactgtgaag ctctttaatc 11880
E--> 1622 ttattctatc tgttggatct gtttgccttt atttgctttg catgtggttt tgctgtttaa 11940
E--> 1623 gataaaggcc atatcttctc ctaattcttt ttccaaatca acacatcaaa tatataaaag 12000
E--> 1624 actccaaata ttttgaatag aatcataatt tatttaatta caaaaaaact taaagaattc 12060
E--> 1625 aagacctgcg atcacaagac aaatacatgt aaggaattaa atatttaaga taccaaccgc 12120
E--> 1626 taataaataa gactcacaat ttctaaaaat taaaacgaaa aaaagaaaaa attagtcatc 12180
E--> 1627 attgcatatc ttagtgaaca aaaatcaata agaaaaggat aatatacttt ttaccaacat 12240
E--> 1628 cacataaacc taaaagcatc tcacaccaaa agtaaattaa aaactcagaa aaagctgaat 12300
E--> 1629 acaagttatg aattttatgg aaagtgttag tgtgttagtg ttgttatcat tacaacttta 12360
E--> 1630 aaataattat gaacatgaaa aaatagattg aacatgaagc agcattggga aggactcgaa 12420
E--> 1631 tgtccctact catactgaca aaacctcaag tgttccagtg cgttaggttt cactttccag 12480
E--> 1632 tagtatgtgt atctgctttt tttgtatata ttaatgtaat agatagtgta gagaatcatg 12540
E--> 1633 aggaacattt tgtaatcata gaactaaggc ataattttga tcgtgtgaaa taatactatt 12600

E--> 1636 taatcaaata aaaatgaaaa aactcattgt ggaaccaaca tta
E--> 1637 aaactacttt catttggttt gtgtgagaaa tataagaatt atcaaacaaa gaaaaaggtt 12744

RAW SEQUENCE LISTING DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:39:44

Input Set : A:\SEQLISTCIP.txt
Output Set: N:\CRF3\08092001\I817762.raw

E--> 1638 ttgcttaatt ataatgatat gaggttcatc aaatttatat accactaaaa tattcctaca 12900
E--> 1639 ctcatccaaa tattattctc gcttatgcag ttttaatcta atgtacaaat catatccata 12960
E--> 1640 agcgcattgg ccgatgctaa aattttggca ttagttgttg atttgttttt cttgagtcct 13020
E--> 1641 atgttcaaaa aatatatttg ataatttaat gtataaatta tacccataat cacattgatc 13080
W--> 1642
aatgcttaaa gttttgtatt agttgttgat tttttgtttg tttgcgtgtg ttgaattttc 13140 ataaatgaaa agtaaatacg
E--> 1643 ataatcatat ttcaaaacgt aaaggtgtta attagtagtc 13200
E--> 1644 taaatggtaa aatataaaca gtatattata aaaattacta aaatggtttt gtaaaaaaaa 13260
E--> 1645 tatgctattt gtattataat gaaattcaaa aattttaaat agaacgtata atttctgcac 13320
E--> 1646 aaagaggttt tgaggtgtta taattcatga agtaaatttt atttactgac gggtaagttg 13380
E--> 1647 tgaaaaagtt tgaagactat tttttttgct tttcacagag aaaactactt tccttttaa 13440
E--> 1648 ttgtatgatg agaaggcaaa agtgcagaca tgtgctttct tttctcccat tttcaacaat 13500
E--> 1649 gtcactcgtt gtattattca tattttagca aactggttat atctatatct atcaatcatt 13560
E--> 1650 tcagaacatc atatccatca gtttttggac attgctacat acgttagtat tgatgtacca 13620
E--> 1651 gttaccctaa caggcttttg catagtgtgg cagaacacgt gaggtgtgat atatgcggat 13680
E--> 1652 gaattctatg ttctgcattt tgttaccatt catataaaag tattgtttta gttgtgctgc 13740
E--> 1653 ggtttaagtc ctaatacaga tttatttgta gtgttatgtt tataaaccac attggaaccc 13800
E--> 1654 aaactctaag agaatataag atcaatgtgt aattaataaa ttttatagtc attcggataa 13860
E--> 1655 aacttagaaa gataacaaaa gtaagaacga gtatttttaa gcgaatactc tttagatatt 13920
E--> 1657 ctttgtattg atcattattg acaaaccatt aaacattttt gtagacccta aaatccgata 13980
E--> 1658 tccaaaaaac aattcttatt 14000

VERIFICATION SUMMARY DATE: 08/09/2001
PATENT APPLICATION: US/09/817,762 TIME: 16:39:45

Input Set : A:\SEQLISTCIP.txt
Output Set: N:\CRF3\08092001\I817762.raw

L:12 M:270 C: Current Application Number differs, Replaced Current Application Number
L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:1499 M:334 W: (2) Invalid Amino Acid in Coding Region, NUMBER OF INVALID KEYS:9
L:1500 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:10
L:1500 M:254 E: No. of Bases conflict, LENGTH:Input:4800 Counted:4720 SEQ:10
M:254 Repeated in SeqNo=10
L:1520 M:334 W: (2) Invalid Amino Acid in Coding Region, NUMBER OF INVALID KEYS:9
L:1521 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:10
L:1558 M:334 W: (2) Invalid Amino Acid in Coding Region, NUMBER OF INVALID KEYS:8
L:1559 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:10
L:1642 M:334 W: (2) Invalid Amino Acid in Coding Region, NUMBER OF INVALID KEYS:9
L:1643 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:10
L:1658 M:252 E: No. of Seq. differs, <211>LENGTH:Input:14000 Found:13690 SEQ:10